

Translation

## PATENT COOPERATION TREATY

PCT/JP2004/008624



## PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference FP04-0161-00	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/JP2004/008624	International filing date (day/month/year) 18 June 2004 (18.06.2004)	Priority date (day/month/year) 03 July 2003 (03.07.2003)
International Patent Classification (IPC) or national classification and IPC C30B 11/00, 29/12		
Applicant HITACHI CHEMICAL CO., LTD.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☐ (sent to the applicant and to the International Bureau) a total of \_\_\_\_\_ sheets, as follows:

☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒ Box No. I Basis of the report

☐ Box No. II Priority

☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

☐ Box No. IV Lack of unity of invention

☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

☐ Box No. VI Certain documents cited

☐ Box No. VII Certain defects in the international application

☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 14 October 2004 (14.10.2004)	Date of completion of this report 07 January 2005 (07.01.2005)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is language of a translation furnished for the purpose of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☒ The international application as originally filed/furnished
- ☐ the description:
- pages \_\_\_\_\_, as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the claims:
- pages \_\_\_\_\_, as originally filed/furnished
- pages\* \_\_\_\_\_, as amended (together with any statement) under Article 19
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:
- pages \_\_\_\_\_, as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	2, 4, 5, 7-19	YES
	Claims	1, 3, 6	NO
Inventive step (IS)	Claims		YES
	Claims	1-19	NO
Industrial applicability (IA)	Claims	1-19	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

Document 1: JP, 2000-272990, A (Ibiden Co., Ltd.), 3 October, 2000 (03.10.00)

Document 2: JP, 3-290390, A (Shin-Etsu Chemical Co., Ltd.), 20 December, 1991 (20.12.91)

Document 3: JP, 2002-29882, A (Shikoku Instrumentation Co., Ltd.), 29 January, 2002 (29.01.02)

Document 4: JP, 10-265296, A (Nikon Corp.), 6 October, 1998 (06.10.98)

Document 5: JP, 2000-272991, A (Canon Inc.), 3 October, 2000 (03.10.00)

The subject matters of claims 1 and 3 do not appear to be novel or to involve an inventive step in view of document 1. Document 1 describes a carbon-made crucible having the inside surfaces at a maximum roughness,  $R_{max}$ , of  $10\mu$  or less that is used in the Bridgeman method, Vertical Gradient Freeze method, etc., i.e., methods for cooling a melted liquid and growing single crystals by using seeds. The  $R_{max}$  values in document 1 overlap with the invention of the present application.

The subject matter of claim 2 does not appear to involve an inventive step in view of document 1. Coating the inside faces of a crucible for growing single crystals with glass carbon is a well-known technology, e.g., as described in the prior art of document 1 (see paragraph [0002]). A person skilled in the art could have easily adopted such well-known technology.

The subject matters of claims 4 and 5 do not involve an inventive step in view of documents 1 and 2. Document 2 describes a crucible for growing single crystals wherein a material containing section is connected with a seed containing section by gradually tapered cone faces (see Fig. 1). A person skilled in the art could have easily used such a crucible and set the angles of such cone faces.

The subject matter of claim 6 does not appear to involve an inventive step in view of document 3. Document 3 describes that the contact angle of the inside faces of a crucible for growing single crystals that contains a melted material liquid is set at 90 degrees or less (see paragraph [0021]).

The subject matters of claims 7 and 8 do not involve an inventive step in view of documents 1 and 3. Coating the inside faces of a crucible for growing single crystals with glass carbon is a well-known technology, e.g., as described in the prior art of document 1 (see paragraph [0002]). A person skilled in the art could have easily adopted such well-known technology for a crucible having the contact angle of the inside faces at 90 degrees or less.

The subject matters of claims 9 and 10 do not involve an inventive step in view of documents 1 and 2. Making the shape of a seed containing section corresponding to the end shape of a seed to be contained would be a common practice for the crucible for growing single crystals.

The subject matter of claim 11 does not appear to involve an inventive step in view of documents 1-4. Calcium fluoride as single crystals to be grown is well known (for example, see cited document 4).

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## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.  
Continuation of: V

The subject matter of claim 12 does not appear to involve an inventive step in view of documents 1-4. If the crucibles described in claims 9-11 do not appear to involve an inventive step in view of documents 1-4, the methods for growing single crystals by means of such crucibles also do not appear to involve an inventive step in view of documents 1-4.

The subject matters of claims 13-16 do not involve an inventive step in view of documents 1, 2 and 5. The constitution of a temperature-measuring means provided in a device for growing single crystals is a well-known technology (for example, see cited document 5).

The subject matter of claim 17 does not appear to involve an inventive step in view of documents 1, 2, 4 and 5. Calcium fluoride as single crystals to be grown is well known (for example, see cited document 4).

The subject matters of claims 18 and 19 do not involve an inventive step in view of documents 1, 2, 4 and 5. If the crucibles described in claims 13-17 do not appear to involve an inventive step in view of documents 1, 2, 4 and 5, the methods for growing single crystals by means of such crucibles also do not appear to involve an inventive step in view of documents 1, 2, 4 and 5.